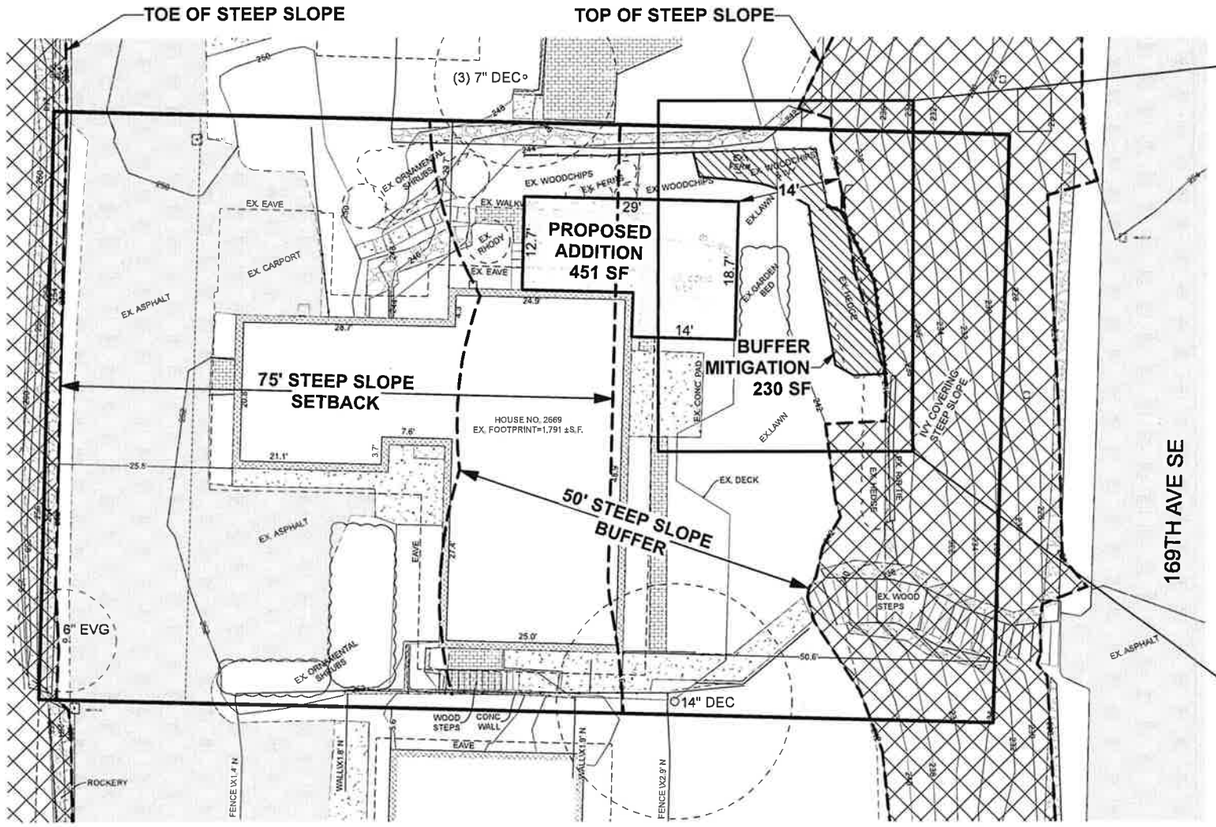
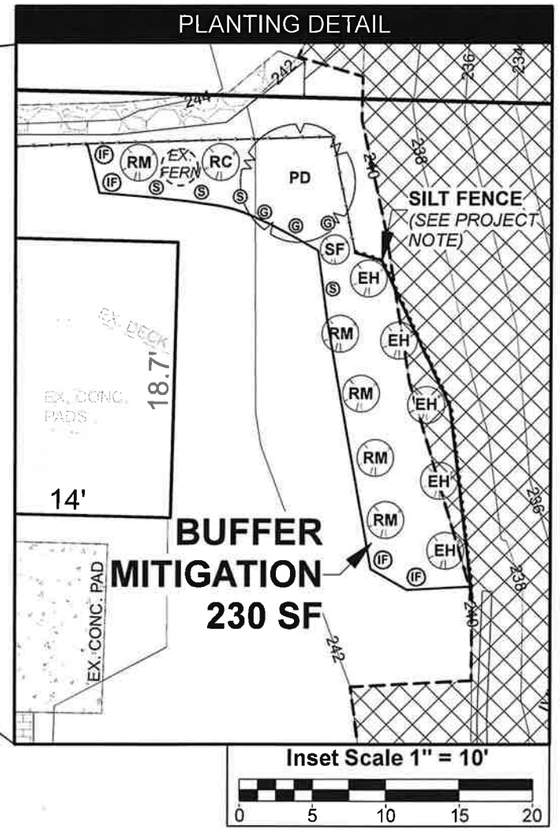
Steep Slope Buffer Impacts and Mitigation Summary

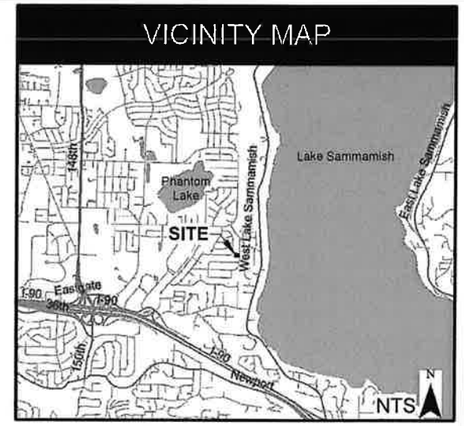
Impact Area (square feet)	Mitigation Type	Mitigation Area (square feet)	Mitigation Ratio
154	Enhancement	230	1.5 :1

BUFFER MITIGATION MAP
FAN SFR ADDITION - 169TH AVE SE
PTN. OF SECTION 12, TOWNSHIP 24N, RANGE 5E W.M.



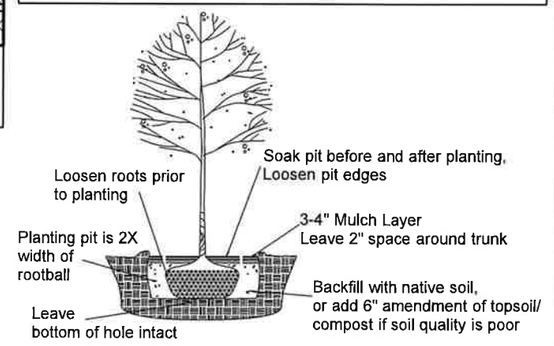


Inset Scale 1" = 10'
0 5 10 15 20



PLANT LEGEND

PD	Pacific Dogwood (*Cornus nuttallii*)	B&B	1
RC	Red-flowering Currant (*Ribes sanguineum*)	1 Gal Pot	1
RM	Rose Meadowsweet (*Spiraea splendens*)	1 Gal Pot	5
EH	Evergreen Huckleberry (*Vaccinium ovatum*)	1 Gal Pot	5
SF	Sword fern (*Polystichum munitum*)	1 Gal Pot	1
IF	Idaho Fescue (*Festuca idahoensis*)	1 Gal Pot	4
S	Coast Strawberry (*Fragaria chiloensis*)	4" Pot	4
G	Wild Ginger (*Asarum canadense*)	4" Pot	3

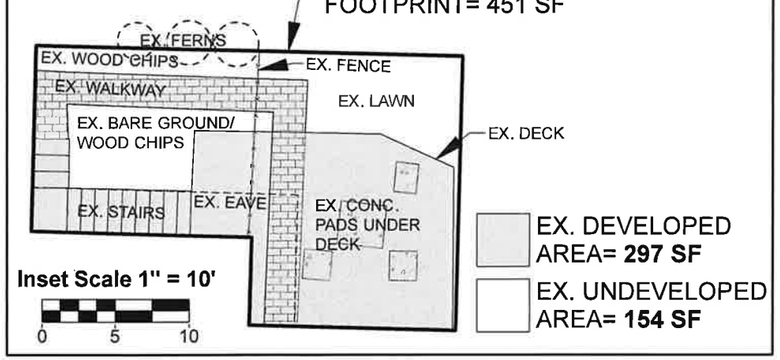


TREE & SHRUB PLANTING DETAIL
No Scale

Scale 1" = 20'
0 10 20 30 40

LEGEND
- STEEP SLOPES >40%
- STEEP SLOPE BUFFER/SETBACK
- BUFFER MITIGATION AREA
- EXISTING VEGETATION

EXISTING CONDITION OF PROJECT FOOTPRINT



Inset Scale 1" = 10'
0 5 10

EX. DEVELOPED AREA= **297 SF**

EX. UNDEVELOPED AREA= **154 SF**

PROJECT NOTE
BEFORE HEDGE REMOVAL COMMENCES, A *SILT FENCE* (OR SIMILAR) SHOULD BE INSTALLED AND LEFT IN PLACE UNTIL NATIVE PLANT INSTALLATION IS COMPLETE AND SOILS ARE STABILIZED.

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
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BUFFER MITIGATION MAP
FAN SFR ADDITION - 169TH AVE SE
City of Bellevue, WA

John Fan
2669 169th Ave SE
Bellevue, WA 98008

Sheet 1/1
WRI Job # 18328
Drawn by: ED
Date: October 12, 2018

Project Narrative

NB: All square footages approximate.

Description of Project Site

Property address is 2669 169th Ave SE, Bellevue, WA 98008 (Tax ID #06273-0050).
The lot is 10368 sq. ft. (0.23 acre) and has a 40% steep slope outlined per survey (1696 sq. ft.) on the east side of the property. There is an existing single family residence with approximately 2700+/- sq. ft. residence and 400+/- sq. ft. garage. Residence also has 700+/- sq. ft. deck on east (slope) side of the property, with staircases that wrap around the house on both north and south sides. The property is accessed via a shared driveway easement covering the west 20' of the property, and the property sits at the toe of a retaining wall created for the lots to the west the property.

Existing landscaping consists of shrubs, ornamental plans, hedges, a small lawn on slope side of property. There is ground cover of undetermined ivy species covering the steep slope area, intermingled with blackberry bushes. There is an existing pathway of compacted gravel plus railroad ties that allows access up the steep slope to the backyard. There is an existing retaining wall at the toe of the eastern steep slope that is outside the property boundary.

Minimizing Impact to Critical Area

The addition area attempts to use the area of the lot that least impacts slopes on the property. We are focusing the addition on the north side of the property (away from slopes to east/west). We are limiting the addition area to cover existing deck, staircase, concrete footings, concrete patio, and pathways. There is basically no vegetation impact in current proposal, as areas impacted are compacted soil due to being under those structures. We are specifically limiting the addition to the staircase on the west (avoids impacting non-critical slope in backyard), the setback to the north, and to the extent of the deck on the east, and to the extent of the concrete footings/patio on the south.

Geotechnical report indicates stable glacial till slope, with no ground water observed in either of 2 borings. Per report,

> *In our opinion, based on the soil conditions encountered in the soil borings, the proposed addition is feasible from a geotechnical point of view.*

Alternatives Considered, Feasibility

The family has 2 adults and 3 children, with grandparents who often visit for extended periods of time. We have staged the remodel into two phases. First phase reconfigured existing floorplan to create separate adults' and kids' baths (previous bedrooms did not meet code requirements for inhabitable bedrooms). This unfortunately reduced the floorplan to 3 code-compliant bedrooms, and our goal is to get to 4 bedrooms, 1 guest bedroom, plus a living room.

There were four primary alternatives considered.

1. North addition only: current proposal. This proposal specifically adds a master suite for adults, and a guest suite plus small living room. The existing structure was remodeled in phase 1, and then addition (this permit) could be handled separately.
2. Build up: add a story to house. This alternative wasn't chosen for the following reasons:
    a. Doing so would require extensive structural modifications to existing structure, in addition to potentially requiring disruption of existing foundation / require more widespread disruption of lot.
    b. There are height restrictions that limit architectural choices. Further, raising an entire additional story would have significant view impact on neighbor to west.
    c. Cost would have been prohibitive, with estimates ranging from $700K to $1.1M, particularly since we have young kids and would need to have enough bedrooms on one floor. Market conditions do not support this level of remodel.
3. North addition + loft: this proposal entailed the addition plus raising the roof of the existing structure to create a loft area. This alternative wasn't chosen due to similar reasons as option #2.

The North addition (this proposal) achieved the goals of the project with least impact to environmental concerns, neighbor considerations, and at the most manageable cost. In discussions with city land use department, they did indicate that option #2 would have lower environmental impact, but that isn't necessarily supported by findings from geotech, architect, and structural engineer due to increased disruption potential from foundation work.

Meeting Decision Criteria

A. All applicable permits will be obtained. Phase 1 of the remodel to existing structure demonstrates our commitment to doing so.
B. See narrative above. We are open to feedback and suggestions.
C. See Performance Standards for Expansion of single-family primary structure below
D. House is served by adequate public existing facilities. Per City of Bellevue Fire Marshall, given the proximity of existing fire hydrants, the only requirement was interconnected monitored fire alarms given our addition was between 500-1000 sq. ft.
E. See Mitigation or Restoration plan below.
F. We intend to comply with all applicable requirements identified.

Performance Standards for Expansion of Single-Family Primary Structure

i. Expansion is along existing building line parallel to the edge of the critical area over the area of the existing deck and concrete footings. In order to maintain setback on north side of property, and to allow for access to addition from existing house structure, we needed to expand east but no further than the existing deck/concrete footings. The footprint of the expansion is approximately 451 sq. ft.
   The layout of the proposed site plan allows us to minimize required utility relocations and crawlspace plumbing/hvac routing.
ii. We are unable to expand to the west due to existing access easement, setbacks, and amount of slope disturbance required. We do have room to expand to north, but this is

already within the critical area buffer. We are unable to expand to the south due to lot setback requirements.

We considered expanding upwards; however, our structural engineer and geotech indicated extensive additional structural and potential foundation impact, which would impact the existing soil, drainage, and structure within the critical area setback to a higher extent than the proposed plan. This is exacerbated by the existing deck structure and extremely limited crawlspace headroom.

Moreover, our neighborhood is subject to architectural review to preserve views. Any expansion upwards would significantly impact neighbors to west, and to a lesser extent neighbors to north and south.

Mitigation/Restoration Plan

There is no habitat impact as part of this proposal. The area of the proposed addition consists of existing concrete footings (for previous hot tub), the deck and staircase, and compacted soil and walkways. There is basically no vegetation in this area due to heavily compacted soil/lack of sunlight.

However, per city recommendations, I've attached a proposed buffer mitigation plan using native plants to offset incremental environmental impact from the addition.

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

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BUFFER MITIGATION PLAN

FOR

FAN SFR ADDITION – 169TH AVE SE

BELLEVUE, WA

Wetland Resources, Inc. Project #18328

Prepared By
Wetland Resources, Inc.
9505 19th Avenue SE, Suite 106
Everett, WA 98208
(425) 337-3174

Prepared For
John Fan
2669 169th Ave SE
Bellevue, WA 98008

October 12, 2018

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1.0 INTRODUCTION

Wetland Resources, Inc. completed a site investigation on October 10, 2018 to evaluate site conditions and mitigation options on and within the vicinity of the 0.23-acre subject property located at 2669 169th Ave SE in Bellevue, Washington. The site is further located within Section 12, Township 24N, Range 5E, W.M. and is composed of one King County tax parcel: 0627300050.

Figure 1: Aerial Photo of the Subject Property.

1.1 SITE DESCRIPTION

The subject site is located in a high-density residential neighborhood, accessed along 169th Ave SE. The property is located approximately 1,000 feet west of Lake Sammamish, and approximately 2,500 feet southeast of Phantom Lake. A majority of the site is relatively level, with a steep slope along the eastern-most portion. Another steep slope area is located just west of the property and paved alleyway. The property is composed of one single-family residence (SFR) with attached garage, which covers approximately 2,640 square feet. A 700 square-foot deck wraps around the house. The eastern steep slope area is covered in well-established vegetation (unknown ivy species) and a few ornamental shrubs. A small lawn with landscaped edges is located between the SFR and steep slope.

1.1.1 Critical Areas

Within the subject site, two steep slope areas were observed: one in the eastern portion of the site (covering 1,696 square feet of the site), and one along the western edge of the site (covering 153 square feet of the site). Steep slope areas are defined as areas with slope greater than 40 percent, at least 1,000 square feet, and with a rise of at least 10 feet (LUC 20.25H.120(A)(2)). Pursuant to LUC 20.25H.120(B)&(C), steep slope areas receive protective buffers of 50 feet from top-of-slope, and structure setbacks of 75 feet from toe-of-slope.

These steep slopes were verified, surveyed, and assessed by *Geo Group Northwest, Inc.* (Geo Group). Please refer to the attached *Geotechnical Engineering Study* (Geo Group, 7/5/18) in Appendix A.

No other critical areas were identified on site during the October 2018 site investigation. No species of local importance or habitats associated with these species were identified on site.

2.0 Proposed Project

The property owner proposes to build an addition along the northeast portion of the existing SFR. The addition footprint covers 451 square feet and is proposed approximately 14 feet (at closest point) from the top of the steep slope to the east. The project area is located completely within the steep slope buffer.

The proposed addition area currently consists of a wrap-around deck and staircase, concrete footings under the deck, paved walkway, maintained lawn, bare/wood-chipped soil, and sparse landscaping. Only a small amount (154 square feet) of undeveloped/pervious area will be impacted by the addition. The remaining impact area is composed of existing developed area and may be excluded from the buffer area, pursuant to LUC 20.25H.120(B)(2).

Pursuant to LUC 20.25H.055(C)(3)(n), expansion of existing SFR primary structures into a critical area buffer is allowed if expansion is not feasible outside of buffers or setbacks, and the expansion serves a function essential to the SFR. Development will follow the performance standards of LUC 20.25H.055(C)(3)(n)(i), as well as steep slope-specific standards of LUC 20.25H.125. Please refer to the Project Narrative for details on how this proposal meets the standards of LUC 20.25H.055(C)(3)(n), LUC 20.25H.055(C)(3)(n)(i), and LUC 20.25H.125.

3.0 Buffer Mitigation Plan

The proposed SFR addition would impact approximately 154 square feet of undeveloped steep slope buffer area. In order to mitigate these impacts, the applicant proposes to enhance 230 square feet of buffer area between the proposed addition and steep slope to the east.

Table 1. Steep Slope Buffer Impacts and Mitigation Summary

Impact Area (square feet)	Mitigation Type	Mitigation Area (square feet)	Mitigation Ratio
154	Enhancement	230	1.5:1

3.1 Mitigation Sequencing

The City of Bellevue requires that all reasonable efforts be taken to avoid and minimize impacts to critical areas and buffers. If impacts do occur, they must be compensated in the following order of preference (LUC 20.25H.215):

1) *Avoiding the impact altogether by not taking a certain action or parts of an action;*
2) *Minimizing impacts by limiting the degree or magnitude of the action and its implementation, by using appropriate technology, or by taking affirmative steps, such as project redesign, relocation, or timing, to avoid or reduce impacts;*
3) *Performing the following types of mitigation (listed in order of preference):*
   a) *Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;*
   b) *Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; or*
   c) *Compensating for the impact by replacing, enhancing, or providing substitute resources or environments;*
4) *Monitoring the hazard or other required mitigation and taking remedial action when necessary.*

The applicant is avoiding impacts to all on-site critical areas. However, complete avoidance of the steep slope buffer and setback is not feasible due to the encumbrance of buffer and/or setback over the entire property.

Impacts to the buffer are minimized to the extent possible by siting a majority of the proposed addition over existing developed/disturbed areas. Impacts to undeveloped buffer area are limited to 154 square feet of maintained lawn and bare ground area. Furthermore, the addition is proposed along the north side of the lot, away from the east and west steep slopes. An alternatives analysis (see project narrative) shows that this proposed location is least impactful to steep slopes, and is most feasible. No impacts to functioning vegetation will occur, and proper TESC procedures and best management practices will be used during construction.

Buffer impacts will be mitigated through enhancement of the sleep slope buffer between the proposed project and eastern steep slope. The mitigation area is located to further protect the eastern steep slope area from residential uses. Mitigation measures will enhance buffer functions provided to the steep slope and will also benefit wildlife habitat. The eastern steep slope and buffer area will see a net gain in functions and values.

All mitigation areas will be monitored for a period of five years from the point of installation per the approved mitigation and monitoring plan. Contingency plans will be followed if deemed necessary by the City or consulting biologist. The monitoring period will end when the definition of success is met.

3.2 Buffer Enhancement Plan

The proposed enhancement area is located along the top of slope just east of the proposed project. Half of the mitigation area currently consists of a sparsely vegetated landscaping bed in the northern portion, and the other half is composed of a non-native hedge. The landscaping bed

currently hosts one sword fern (*Polystichum munitum*) and ornamental ivy (*Hedera sp.*). The ornamental hedge (*Cotoneaster sp.*) covers a six-foot wide area between the maintained lawn and ivy-covered steep slope. The proposed enhancement area is near level.

The applicant proposes to remove the non-native hedge and ivy from the enhancement area, and install native plant species in their place. Enhancement measures will result in improved slope stabilization and erosion control functions, higher plant cover and diversity, and potential wildlife habitat. A net gain in steep slope buffer functions will be obtained through the proposed mitigation plan.

3.2.1 Non-native Plant Removal

Before native plant installation, the non-native hedge and ivy will be removed from the enhancement area. The existing sword fern shall be preserved in place. All ivy plant fragments shall be removed from the site. Prior to hedge removal, a silt fence (or similar erosion control device) shall be installed and left in place until native plant installation is complete and soils are stabilized. After non-native plant removal, a topsoil or compost soil amendment may be tilled into native soils as necessary and recommended by the contracted landscaper.

3.2.2 Planting Plan

Non-native plants and bare soils in the enhancement area will be replaced with a diverse palette of native trees, shrubs, and groundcover. One tree species, four shrub species, and three groundcover species are proposed as shown in the table below. After planting, the entire enhancement area shall be stabilized with woodchip mulch (see *Planting Notes* for more detail). The attached *Buffer Mitigation Map* (Appendix B) displays the proposed plant schedule and layout.

Buffer Enhancement Area (230 square feet)

Common Name	***Latin Name***	***Form***	***Min. Spacing***	***Quantity***
Pacific dogwood	*Cornus nuttallii*	B&B	9' O.C.	1
Red-flowering currant	*Ribes sanguineum*	1 gallon pot	4' O.C.	1
Rose meadowsweet	*Spiraea splendens*	1 gallon pot	4' O.C.	5
Evergreen huckleberry	*Vaccinium ovatum*	1 gallon pot	4' O.C.	5
Sword fern	*Polystichum munitum*	1 gallon pot	3' O.C.	1
Idaho fescue	*Festuca idahoensis*	1 gallon pot	2' O.C.	4
Coast strawberry	*Fragaria chiloensis*	4-inch pot	2' O.C.	4
Wild ginger	*Asarum canadense*	4-inch pot	2' O.C.	3

3.2.3 Planting Notes

Plant between late fall and early spring and obtain all plants from a reputable nursery. Care and handling of all plant materials is extremely important to the overall success of the project. The origin of all plant materials specified in this plan shall be native plants, nursery grown in the Puget Sound region of Washington. Some species substitution may be allowed with agreement of the contracted ecologist.

Pre-Planting Meeting

Prior to control of invasive species or installation of mitigation plantings, a site meeting between the contracted landscaper and the consulting ecologist may occur to resolve any questions that

may arise. During this meeting a discussion regarding plant spacing and proper locations of plant species will occur, as well as an inspection of the plants prior to planting. Minor adjustments to the original design may be required prior to and during construction.

Handling
Plants shall be handled so as to avoid all damage, including: breaking, bruising, root damage, sunburn, drying, freezing or other injury. Plants must be covered during transport. Plants shall not be bound with wire or rope in a manner that could damage branches. Protect plant roots with shade and wet soil in the time period between delivery and installation. Do not lift container stock by trunks, stems, or tops. Do not remove from containers until ready to plant. Water all plants as necessary to keep moisture levels appropriate to the species horticultural requirements. Plants shall not be allowed to dry out. All plants shall be watered thoroughly immediately upon installation. Soak all containerized plants thoroughly prior to installation.

Storage
Plants stored by the Permittee for longer than one month prior to planting shall be planted in nursery rows and treated in a manner suitable to those species' horticultural requirements. Plants must be re-inspected by the landscape architect prior to installation.

Damaged plants
Damaged, dried out, or otherwise mishandled plants will be rejected at installation inspection. All rejected plants shall be immediately removed from the site, and properly replaced.

Plant Names
Plant names shall comply with those generally accepted in the native plant nursery trade. Any question regarding plant species or variety shall be referred to the landscape architect or consulting ecologist. All plant materials shall be true to species and variety and legibly tagged.

Quality and condition
Plants shall be normal in pattern of growth, healthy, well-branched, vigorous, with well-developed root systems, and free of pests and diseases. Damaged, diseased, pest-infested, scraped, bruised, dried out, burned, broken, or defective plants will be rejected. Plants with pruning wounds over 1" in diameter will be rejected.

Roots
All plants shall be balled and burlapped (B&B) or containerized, unless explicitly authorized by the landscape architect and/or consulting ecologist. Rootbound plants or B&B plants with damaged, cracked, or loose rootballs (major damage) will be rejected. Immediately before installation, plants with minor root damage must be root-pruned. Matted or circling roots of containerized plantings must be pruned or straightened and the sides of the root ball must be roughened from top to bottom to a depth of at least an inch.

Sizes
Plant sizes shall be the size indicated in the plant schedule in approved plans, unless approved by the landscape architect or consulting ecologist. Larger stock may be acceptable provided that it has not been cut back to the size specified, and that the root ball is proportionate to the size of the plant. Smaller stock may be acceptable, and preferable under some circumstances, based on site-specific conditions. Measurements, caliper, branching, and balling and burlapping shall conform to the American Standard of Nursery Stock by the American Association of Nurserymen (latest edition).

Form
Evergreen trees shall have single trunks and symmetrical, well-developed form. Deciduous trees shall be single trunked unless specified as multi-stem in the plant schedule. Shrubs shall have multiple stems and be well-branched.

Timing of Planting
Unless otherwise approved by the landscape designer/consulting ecologist, all planting shall occur between October 1 and March 1. Overall, the earlier the plants go into the ground during the dormant period, the more time they have to adapt to the site and extend their root systems before the water demands of summer.

Weeding
Non-native, invasive vegetation in the mitigation area will be hand-weeded from around all installed plants at the time of installation and on a routine basis throughout the monitoring period. No chemical control of vegetation on any portion of the site is recommended without prior approval from the City and consulting ecologist.

Site conditions
The landscaping contractor shall immediately notify the landscape designer and/or consulting ecologist of drainage or soil conditions likely to be detrimental to the growth or survival of plants. Planting operations shall not be conducted under the following conditions: freezing weather, when the ground is frozen, excessively wet weather, excessively windy weather, or in excessive heat.

Planting Pits
Planting pits shall be circular or square with vertical sides, and shall be at least 12" wider in diameter than the root ball of the plant. Break up the sides of the pit in compacted soils. Set plants upright in pits. All burlap shall be removed from the planting pit/rootball. Backfill of native soils shall be worked back into holes such that air pockets are removed without adversely compacting soils.

Fertilizer
Slow release fertilizer may be used if pre-approved by the landscape architect and consulting ecologist. Fertilizers shall be applied only at the base of plantings underneath the required covering of mulch (that does not make contact with stems of the plants). No fertilizers shall be placed within planting holes.

Support Staking
Most shrubs and many trees DO NOT require any staking. If the plant can stand alone without staking in a moderate wind, do not use a stake. If the plant needs support, then strapping or webbing should be used as low as possible on the trunk to loosely brace the tree with two stakes. Do not brace the tree tightly or too high on the trunk. If the tree is unable to sway, it will further lose the ability to support itself. Do not use wire in a rubber hose for strapping as it exerts too much pressure on the bark. As soon as supporting the plant becomes unnecessary, remove the stakes. All stakes must be removed within two (2) years of installation.

Arrangement and Spacing
The plants shall be arranged in a pattern with the appropriate numbers, sizes, species, and distribution that are required in accordance with the approved plans. The actual placement of individual plants shall mimic natural, asymmetric vegetation patterns found on similar undisturbed sites in the area. Spacing of the plantings may be adjusted to maintain existing vegetation with the agreement of the landscape designer and/or consulting ecologist.

Mulching
Mulch (woodchip/arborist) shall be applied to the entire enhancement area after plant installation. Mulch shall be no less than 3 inches deep, and shall be kept 2 inches away from the trunks/stems of installed plants to prevent damage.

3.3 Mitigation Goals and Objectives

The goal of this mitigation plan is to improve the functions of the steep slope buffer, and further protect the on-site steep slope from on-going residential uses. The specific goals of the plan are to increase vegetative species diversity and cover, increase browsing and cover opportunities for wildlife, increase soil stabilization capacity, limit erosion, improve the bio-filtration capacity of the buffer, and decrease invasive and non-native plant cover without harming steep slope areas.

To achieve the goals previously stated, invasive and non-native plants will be carefully removed from the steep slope buffer, and diverse native vegetation will be installed. Installed vegetation will be of high value to wildlife, thicket-forming, form wide-spreading and complex root structure, and will densely cover the ground surface.

Over time, this mitigation project is expected to achieve a net-gain in functions to wildlife, water quality, hydrology, erosion capacity, and soil stability within the buffer area, and is expected to better protect the on-site steep slope.

3.4 PROJECT MONITORING PROGRAM

Monitoring shall be conducted annually for five years in accordance with the approved Buffer Mitigation Plan.

Requirements for monitoring project:
1. Initial compliance report/as-built map
2. Annual site inspection (once per year) for five years
3. Annual reports including final report (one report submitted in the fall of each monitored year)

Purpose for Monitoring
The purpose for monitoring shall be to evaluate the project's success. Success will be determined if monitoring shows at the end of five years that the definitions of success stated below are being met. Access shall be granted to the planting area for inspection and maintenance to the contracted landscaper and/or ecologist and the City during the monitoring period or until the project is evaluated as successful.

Vegetation Monitoring
Vegetation monitoring data shall be collected throughout the mitigation site, and detail groundcover, shrub, and tree coverage and species survival. At least two photo points will be established, from which photos of the mitigation site shall be taken throughout the monitoring period. Photo point locations and directions must be identified on the as-built map (may be hand drawn on approved maps/plans). Vegetation monitoring shall occur annually between August 1 and September 30 (prior to leaf drop), unless otherwise specified.

3.4.2 Monitoring Reports
Monitoring reports shall be submitted by December 31 of each year during the monitoring period. As applicable, monitoring reports must include descriptions/data for:

(1) Site plan and vicinity map;
(2) Historic description of project, including date of installation, current year of monitoring, restatement of planting/restoration goals, and performance standards;
(3) Plant survival, vigor, and areal coverage for every plant stratum (sampling point data), and explanation of monitoring methodology in the context of assessing performance standards;
(4) Slope condition and site stability;
(5) Overall buffer conditions, e.g., surrounding land use, use by humans and/or wildlife;
(6) Observed wildlife, including amphibian, avian, and others;
(7) Assessment of invasive biota and recommendations for management;
(8) Color photographs taken from permanent photo points that shall be depicted on the monitoring report map.

3.4.3 Project Success and Compliance
Upon installation and completion of the approved mitigation plan, an inspection by a qualified ecologist and/or City will be made to determine plan compliance. A compliance report will be supplied to the City of Bellevue within 30 days of the completion of planting. The Applicant or

consulting ecologist/landscape designer will perform condition monitoring of the plantings before October of each year for five years. A written report describing the monitoring results will be submitted to the City after each site inspection of each monitored year. Final inspection will occur five years after completion of this project, and a report on overall project its success will be prepared.

Performance Standards
Project success will be measured by native species survival and richness, and areal cover of native and invasive plants. The mitigation area must achieve the following Performance Standards to be considered successful:

	Year 1	**Year 3**	**Year5**
Native Plant Survival	100%	90%	85%
Invasive/Non-native species cover	<5%	<5%	<5%
Species Richness (# species present)	8	6	6

Assurance Device
The City of Bellevue may require a performance or maintenance assurance device if it is determined to be necessary. The City will determine the type and amount of assurance device required. The performance or maintenance assurance device amount is typically determined from the estimated cost of work. An estimate of the cost of project installation is provided below.

Cost of Plants and Labor 1-gal pots ($11.50 per plant)= 16 4-inch pots ($5 per plant)= 7 B&B (balled & burlapped) ($75 per plant)= 1	$294.00
Cost of Silt Fence ($1.60/linear foot)	$40.00
Cost of Mulch ($3.25/sq.yd.)	$80.00
TOTAL ESTIMATED COST	$414.00

3.5 MAINTENANCE PROGRAM

The planting areas will require periodic maintenance to remove undesirable species and replace vegetation mortality. Maintenance shall occur twice a year for the 5-year monitoring period in accordance with the approved plan. Maintenance may include, but will not be limited to, removal of competing grasses, irrigation, replacement of plant mortality, and the replacement of mulch for each maintenance period. The Applicant is responsible for maintenance in all monitoring years.

Duration and Extent
In order to achieve performance standards, the Permittee shall have the planting area maintained for the duration of the five-year monitoring period. Maintenance will include: watering, weeding around the base of installed plants, pruning, replacement, re-staking, removal of all classes of noxious weeds (see Washington State Noxious Weeds List), and any other measures needed to insure plant survival.

Survival
The Permittee shall be responsible for the health of 100 percent of all newly installed plants for *one growing season* after installation has been accepted by the City. A growing season for these purposes is defined as occurring from spring to spring (March 15 to March 15 of the following year). For fall installation (often required), the growing season will begin the following spring. The Permittee shall replace any plants that are failing, weak, defective in manner of growth, or dead during this growing season.

Installation Timing for Replacement Plants
Replacement plants shall be installed between October 1 and March 1, unless otherwise determined by the landscape designer and/or City staff.

Standards for Replacement Plants
Replacement plants shall meet the same standards for size and type as those specified for the original installation unless otherwise directed by the landscape designer, consulting ecologist, and/or City staff.

Mulch
All plantings will have mulch reapplied at their bases for at least the first two growing years of the monitoring period. Plants shall receive no less than 3 inches of wood chips (a.k.a. arborist mulch). Mulch shall be kept well away (at least 2 inches) from the trunks and stems of woody plants.

Herbicides/Pesticides
Chemical controls shall not be used in the planting area, sensitive areas, or their buffers. However, limited use of herbicides may be approved depending on site-specific conditions, only if approved by City staff and the consulting ecologist.

Watering/Irrigation
Water should be provided during the dry season (~July 1 through September 15) to insure plant survival and establishment. Water should be applied at a rate of one inch of water twice per week during the dry season. The landscaping contractor will determine if additional watering is necessary.

3.6 CONTINGENCY PLAN

If, during any of the annual inspections, performance standards are not being met for species survival, additional plants of the same species will be added to the mitigation area. If invasive, non-native species exceed 5 percent cover (as measured by areal cover), manual control shall occur. If any of these situations persist to the next inspection, a meeting with the landscape designer/consulting ecologist and the Permittee will be held to decide upon contingency plans. Elements of a contingency plan may include, but will not be limited to: more aggressive weed control, mulching, replanting with larger plant material, species substitution, fertilization, soil amendments, and/or irrigation.

4.0 Use Of This Report

This Buffer Mitigation Plan is supplied to John Fan as a means of mitigating for project impacts, as required by the City of Bellevue during the permitting process. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions.

The laws applicable to critical areas are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

The work for this report has conformed to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report, and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.

Elyse Denkers
Associate Ecologist

Scott Brainard, PWS
Principal Ecologist

5.0 REFERENCES

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APPENDIX A

GEOTECHNICAL ENGINERRING STUDY (GEO GROUP)

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists,
& Environmental Scientists

October 18, 2018 G-4710

John Fan
2669 -169th Ave SE
Bellevue, WA 98008

Subject: **Geotechnical Evaluation**
Proposed Addition
2669 -169th Ave SE
Bellevue, WA 98008

Ref. Geotechnical Engineering Study, by GEO Group Northwest Inc., dated July 5 2018.

Dear Mr. John Fan,

At your request GEO Group Northwest Inc. has reviewed the previous geotechnical report and evaluated the potential influence of the proposed addition on the steep slope on the eastern side of the lot. The evaluation was performed to address comments made by representatives of the City of Bellevue in regard to the steep slope.

Steep Slope Evaluation:

In our opinion, the proposed addition will not have a negative impact on the stability of the existing steep slope, and the slope in its current condition appears to be stable. The slope is approximately 12 to 15 feet in height, extending downslope to 169th Ave SE. We understand that the proposed addition will be located west of the steep slope, with its closest point being the northeastern corner, which will be located 14 feet from the top of the slope. As referenced in the above geotechnical report, according to published geologic maps of the area the surficial geology of the subject lot consists of glacial till. Our soil borings that were performed onsite during the original geotechnical study confirmed the presence of cemented very-dense glacial till.

Based on the presence of glacial till, and the extent of the addition, it is in our opinion that the proposed construction will not increase the landslide hazard of the site. Glacial till soils have a high shear strength and are known to be highly resistant to slope failures, therefore the landslide hazard potential is interpreted to be low.

Additional Recommendations:

The base of the steep slope is faced with a small rockery, while the rest of the slope is covered with ivy and other vegetation. To help prevent erosion we recommend that the vegetation on the

steep slope is left in place. In addition, to help maintain stability of the slope, we recommend that the slope is left undisturbed during the construction of the addition.

Limitations

The findings and recommendations stated herein are based on field observations, our experience on similar projects and our professional judgement. The recommendations presented herein are our professional opinion derived in a manner consistent with the level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area and within the project schedule and budget constraints. No warranty is expressed or implied. In the event that site conditions are found to differ from those described herein, we should be notified so that the relevant recommendations can be reevaluated and modified if appropriate.

Closing

We appreciate this opportunity to provide you with geotechnical engineering services. Please feel free to call us if you have any questions.

Sincerely,

GEO GROUP NORTHWEST, INC.

Martin Cross G.I.T.
Staff Geologist

William Chang, P.E.
Principal Engineer

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

July 5th, 2018 G-4710

John Fan
2669 -169th Ave SE
Bellevue, WA 98008
Email: johndfan@hotmail.com

Subject: **Geotechnical Engineering Study**
2669 -169th Ave SE
Bellevue WA, 98008

Dear John Fan,

GEO Group Northwest is pleased to provide geotechnical consulting services for the proposed addition, at the above address in Bellevue, Washington. Our services were provided based on our proposal dated May 29th, 2018, and consisted of a geotechnical report, using information from the two hand auger soil borings we performed on June 15th, 2018.

Background:

The subject lot is located in a primarily residential area in eastern Bellevue, near lake Sammamish. The site topography consists of a relatively level area in the middle of the lot, and a steep slope on the eastern side, sloping downward to 169th Ave SE. There is a steep slope on the western side that is cut by a driveway. The existing home is an approximately 2,740 square foot, one-story, single-family home, with a daylight basement, and an attached garage. We understand that the proposed project would build an addition onto the northeastern portion of the home.

Geologic Overview:

According to published geologic maps of the project site, the surficial geology consists of glacial till, deposited during the Vashon stade of the Fraser glaciation.[1] Glacial till consists of an unsorted mixture of sand, silt, gravel, and some cobbles. Clasts are typically sub-rounded to rounded. Intercalated sand lenses and some fractures are common. Glacial till is typically dense to very dense due to being overridden by the glacier during its deposition, although the upper weathered section (~3 feet) can be medium-dense to dense.

[1]Booth, Derek B., et al., "*Geologic Map of the East Half of Bellevue South 7.5' x 15' Quadrangle*" U.S. Geological Survey, Map 3211 (2012).

Environmental Critical Areas Review:

According to the City of Bellevue Critical Hazards Map, the project site falls within a steep slope environmental critical area (ECA). The steep slope is located on the eastern side of the lot and is approximately 12-15 feet in height.

Subsurface Conditions

On June 15th, 2018, GEO Group Northwest Inc., performed 2 hand auger soil borings, HA1 and HA2, located on the eastern side of the home. The approximate locations of the two borings are illustrated on Plate 2 – Site Plan. Boring HA1 was advanced to 2 feet, terminating due to increased gravel content and soil density preventing further advancement using a hand auger, while Boring HA2 was terminated at 1.75 feet for the same reasesons. Ground water was not observed in either boring. The soils encountered consisted of a surficial layer of topsoil, underlain by brown to gray-brown, dense gravelly sand, extending to a depth of 2 feet in boring HA1, and 1.75 feet in boring HA2, where each borehole was terminated. The soils encountered in both borings have been interpreted as glacial till soils.

Seismic Considerations

Based on the presence of dense glacial till, the project site is seismically classified as Site Class D, Stiff Soil Profile, in accordance with the International Building Code and ASCE Chapter 20. Seismic design parameters applicable for the site are as follows:

$S_S = 1.320$ g	$S_{MS} = 1.320$ g	$S_{DS} = 0.880$ g
$S_1 = 0.505$ g	$S_{M1} = 0.757$ g	$S_{D1} = 0.505$ g

The potential for liquefaction and/or lateral spreading is negligible based on the presence of glacially consolidated soil. No known faults intersect the subject property and the risk of surface rupture, as a result of a large magnitude seismic event, is interpreted as very low. No geotechnical seismic mitigation measures are recommended.

Conclusions and Recommendations

In our opinion, based on the soil conditions encountered in the soil borings, the proposed addition is feasible from a geotechnical point of view.

Based on the topography of the site, and the soils encountered in the borings, it appears that the steep slope was created during the original grading of the nearby lots, and 169th Ave SE. In its current condition, the steep slope appears to be stable. As long as our recommendations for grading and earthwork are followed the construction should not negatively impact slope stability on the project site.

Foundations

Vertical support for the proposed addition can be achieved using conventional strip and column footings. Footings should be placed directly on dense native soils or on compacted structural fill or crushed rock that extends down to dense soil. Structural fill should extend out beyond the bottom of the footing at a 1H:1V (horizontal:vertical). For structural fill compaction specifications refer to the Grading and Earthwork section. The following are the recommended design criteria for conventional spread footings:

- Allowable bearing capacity for dense native soils and structural fill: = 2,500 psf
- Minimum depth to the bottom of perimeter footings below grade: = 18 inches
- Minimum depth to the bottom of interior footings below top of floor slab: = 12 inches
- Minimum width of strip wall footings: = 16 inches
- Minimum width of column footings: = 24 inches

A one-third increase in the above allowable bearing pressures can be used when considering short-term transitionary wind or seismic loads. Lateral loads against the building foundations can be resisted by friction between the foundation and the supporting subgrade and by passive earth pressure acting on the buried portions of the foundations. For the latter, the material adjacent to the foundation needs to be compacted. Our recommended parameters are as follows:

- Passive Pressure (Lateral Resistance):
  - 350 pcf, equivalent fluid weight, for structural fill or undisturbed dense native soil
- Coefficient of Friction:
  - 0.35 for structural fill or competent undisturbed native soil

Slab-on-Grade Floors:

Subgrade support for slab-on-grade floors should be prepared following the same recommendations for foundations, with the floor slab supported on dense native soil or on structural fill. If loose soil conditions are encountered, we recommend removing the top foot of the soil subgrade (below the capillary break), compacting the underlying subgrade to a dense non-yielding condition and replacing the top foot with fill compacted to a dense non-yielding condition.

A capillary break and vapor barrier should be installed below areas of dry storage and heated space to prevent wicking of moisture through the slab. The capillary break should consist of a minimum of 6-inch-thick free-draining layer of clean crushed rock (no minus) or a granular material containing no more than 5 percent fines passing the No. 4 (1/4-inch) sieve.

To reduce water vapor transmission through the slab we recommend installing a 10-mil reinforced vapor barrier, such as Moistop® by Fortifiber Corporation, between the capillary break and slab. 2 to 4 inches of sand may be placed over the membrane for protection during construction.

Conventional Concrete Basement Walls

The following recommendations regarding conventional concrete basement walls are provided for basement walls up to 10 feet in height. If higher walls are planned, please contact us to review and possibly modify the following recommendations.

Basement walls should be supported on acceptable bearing soils, such as those described in the foundation recommendations in this report, or on structural fill that has been placed on a subgrade of these soils. Basement walls are restrained horizontally at the top therefore they are considered unyielding and should be designed using an at-rest earth pressure. Our recommended soil engineering parameters for basement wall design are as follows:

At-Rest Earth Pressure:

- 45 pcf, equivalent fluid pressure, for level ground behind the walls;
- 60 pcf, equivalent fluid pressure, for wall backslope of 2H:1V

Passive Earth Pressure

- 350 pcf, equivalent fluid pressure, for undisturbed, native dense native soil or structural fill and level ground in front of the wall for a distance of four times the wall height;

- 250 pcf, for undisturbed, native dense soil or structural fill and a downward slope of 2H:1V in front of the wall within a distance of four times the wall height

Base Friction

- 0.35 for structural fill or competent undisturbed native soil

Surcharge loads imposed on walls due to driveways and traffic (including that during construction), upward sloping ground, or other conditions that could impose loads against the walls, should be added to the active and at-rest earth pressures stated above. Also, downward sloping ground in proximity to the walls should be evaluated, as it may have the effect of reducing the value of the allowable passive earth pressure stated above.

To prevent the buildup of hydrostatic pressure behind conventional basement walls, we recommend that a vertical drain mat, such as Miradrain 6000 or similar product, be used to facilitate drainage adjacent to the wall. The drain mat should extend from near the finished surface grade, downward to the bottom of the wall. A drainage collection pipe consisting of rigid 4"-diameter perforated PVC pipe surrounded with gravel and geotextile filter fabric (Mirafi 140NL, or equivalent) can be laid alongside the base of the wall and sloped to an acceptable tightline connection. In addition to the drain mat, we recommend that a zone of free-draining backfill material at least 12 inches wide should be placed against the matted wall. This backfill should extend downward to the drainage collection pipe. A layer of non-woven geotextile filter fabric should separate the free-draining backfill material from the adjacent soils or fills

The top 12 inches of the fill behind the wall can consist of topsoil if desired. This material can be separated from the underlying more granular drainage material by a geotextile fabric, if desired. Alternatively, the surface can be sealed with asphalt or concrete paving. Nearby final grades should be sloped to drain away from the wall, or other measures (such as strip or ribbon drains) should be used to intercept surface water that flows toward the wall.

The backfill for conventional concrete basement walls should be compacted to a dense condition to mitigate the potential for later ground settlement or excessive saturation. Wall backfill that also will support structures or slab should be placed and compacted as structural fill. We

recommend that restrained walls not be backfilled until their restraint has been completed, unless approved by the project structural engineer. The compacting machinery that is used should be compatible with the wall's resistance capacity against the temporary loading effects produced by operation of the machinery. In this respect, the contractor should use care if machinery such as a vibratory roller or hoe pack is used.

Grading and Earthwork

Site Clearing and Erosion Control

Vegetation, topsoil, organics, debris, and any other detrimental material within the building and driveway areas should be removed. Temporary erosion and sedimentation controls (TESCs) should be installed as part of the site clearing process. We recommend that silt fences be installed down-gradient of the disturbed areas, to prevent sediment-laden runoff from discharging offsite. Exposed soils should be covered with plastic sheeting when they are not in use, to prevent erosion or softening. Upon project completion silt fences should be left in place while exposed soils are revegetated to prevent post project erosion.

Excavations and Slopes

Temporary excavation slopes should not be greater than the limits specified in local, state and federal government safety regulations. If groundwater seepage is encountered during excavation, the excavation work should be halted, and the stability of the excavation should be evaluated on site by the geotechnical engineer. In our opinion temporary excavations greater than 4 feet in depth should be no steeper than 1H:1V (horizontal to vertical). Permanent slopes should be no steeper than 2H:1V.

We recommend that a GEO Group Northwest representative be on site during grading to verify the soil conditions and to evaluate excavation stability, particularly if groundwater seepage, caving soils, or other adverse conditions are encountered.

Structural Fill

Structural fill consists of materials used to support buildings, pavements, sidewalks, or other structural elements. Materials stored on site for later use as structural fill should be covered with plastic sheeting if the material is moisture sensitive. Site soils containing silt are generally moisture sensitive. Structural fill should be placed and compacted in accordance with the

recommendations provided below or as otherwise approved by the geotechnical engineer during construction.

Structural fill should consist of clean granular soil that does not contain rocks larger than 3 inches in diameter and should be free of organics and other deleterious materials. During wet weather we recommend using a material with a fines content of less than 5 percent (material finer than the No. 200 sieve). Material should be placed and compacted at or near its optimum moisture content. Material that is too wet to meet compaction specifications will have to be dried by aeration or be replaced. Structural fill should be spread and compacted in lifts of 10 inches or less in thickness in an un-compacted state.

Compaction Specifications:

Structural fill placed below foundation footings, floor slabs, or other structural elements, should be compacted to a minimum of 95% of the material's dry maximum dry density, as determined by ASTM D1557 (Modified Proctor).

Drainage

Water should not be allowed to stand in areas where foundations or slabs are to be constructed. During wet weather these areas should be protected by covering the surface with plastic sheeting and directing the water away from the area. Final grades should direct drainage away from the building.

Roof downspouts should be tight-lined separately from the subsurface drainage systems used for foundation footings. We recommend that footing drains are installed along the perimeter foundation. The footing drains should consist of a minimum 4-inch diameter, perforated, rigid, PVC pipe surrounded by clean crushed rock or gravel, and lined with non-woven geotextile filter fabric, as illustrated on Plate 3 - Conventional Footing Drain Detail. Drains should be sloped at a sufficient inclination to allow water to flow.

Limitations

The findings and recommendations stated herein are based on field observations, our experience on similar projects and our professional judgement. The recommendations presented herein are our professional opinion derived in a manner consistent with the level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area and within the project schedule and budget constraints. No warranty is expressed or

implied. In the event that site conditions are found to differ from those described in this report, we should be notified so that the relevant recommendations in this report can be reevaluated and modified if appropriate.

Closing

We appreciate this opportunity to provide you with geotechnical engineering services. Please feel free to call us if you have any questions.

Sincerely,

GEO GROUP NORTHWEST, INC.

Martin Cross G.I.T.
Staff Geologist

William Chang, P.E.
Principal Engineer

Plates and Attachments

Plate 1 - Vicinity Map
Plate 2 - Project Site Plan
Plate 3 - Conventional Footing Drain Detail
Attachment A – Soil Boring Logs

Source: King County iMap (2018)

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

SITE VICINITY MAP

2669 –169th AVE SE
BELLEVUE WASHINGTON

SCALE: 1" = 1 Mile	DATE: 7/5/2018	MADE: MC	CHKD: WC	JOB NO. G-4710	PLATE: 1

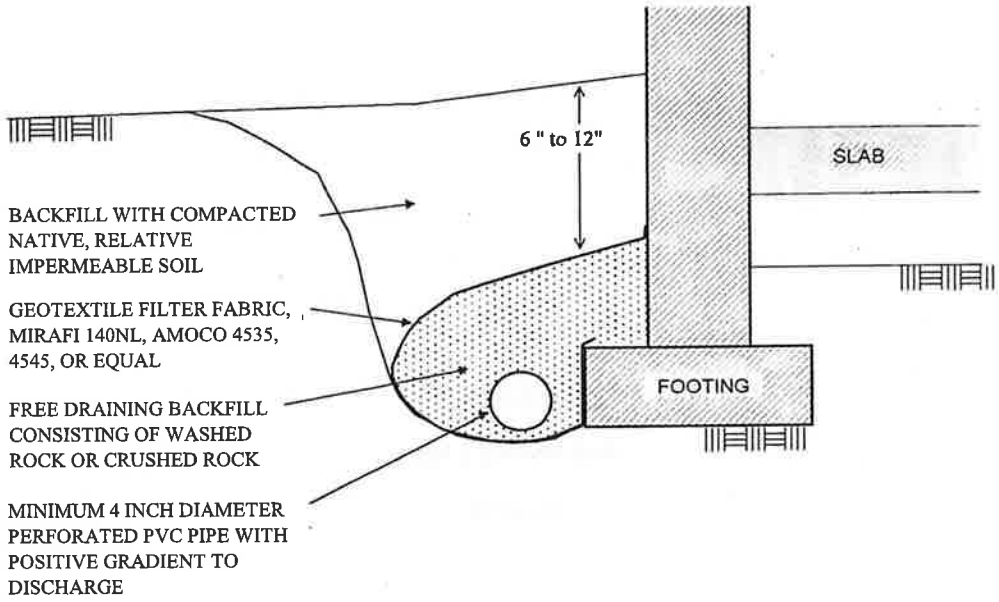
Source: King County iMap (2018)

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

PROJECT SITE PLAN

2669 –169th AVE SE
BELLEVUE WASHINGTON

SCALE: 1" = 30'	DATE: 7/5/2018	MADE: MC	CHKD: WC	JOB NO. G-4710	PLATE: 2



NOT TO SCALE

NOTES:

1) Do not replace rigid PVC pipe with flexible corrugated plastic pipe.
2) Perforated or slotted PVC pipe should be tight-lined and laid with perforations or slots down, with positive gradient to discharge.
3) Do not connect roof downspout drains into the footing drain lies

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

CONVENTIONAL FOOTING DETAIL

2669 –169th AVE SE
BELLEVUE, WASHINGTON

SCALE: NONE	DATE: 7/5/2018	MADE: MC	CHKD: WC	JOB NO. G-4710	PLATE: 3

Attachment A

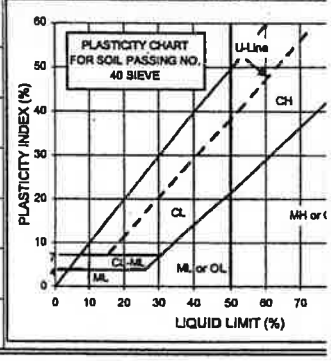
Soil Boring Logs

G-4710

LEGEND FOR SOIL CLASSIFICATION AND PENETRATION TEST DATA

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)

MAJOR DIVISION			GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRI	
COARSE-GRAINED SOILS	GRAVELS (More Than Half Coarse Fraction is Larger Than No. 4 Sieve)	CLEAN GRAVELS (little or no fines)	GW	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURE, LITTLE OR NO FINES	CONTENT OF FINES BELOW 5%	Cu = (D60 / D10) greater Cc = (D30)² / (D10 * D60) betv
			GP	POORLY GRADED GRAVELS, AND GRAVEL-SAND MIXTURES LITTLE OR NO FINES		CLEAN GRAVELS NOT MEE REQUIREMENTS
		DIRTY GRAVELS (with some fines)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12%	GM: ATTERBERG LIMITS BE or P.I. LESS THA
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES		GC: ATTERBERG LIMITS AB or P.I. MORE THA
More Than Half by Weight Larger Than No. 200 Sieve	SANDS (More Than Half Coarse Fraction is Smaller Than No. 4 Sieve)	CLEAN SANDS (little or no fines)	SW	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	CONTENT OF FINES BELOW 5%	Cu = (D60 / D10) greater Cc = (D30)² / (D10 * D60) betv
			SP	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES		CLEAN SANDS NOT MEETI REQUIREMENTS
		DIRTY SANDS (with some fines)	SM	SILTY SANDS, SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12%	ATTERBERG LIMITS BELO with P.I. LESS THA
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES		ATTERBERG LIMITS ABO with P.I. MORE THA
FINE-GRAINED SOILS	SILTS (Below A-Line on Plasticity Chart, Negligible Organics)	Liquid Limit < 50%	ML	INORGANIC SILTS, ROCK FLOUR, SANDY SILTS OF SLIGHT PLASTICITY		
		Liquid Limit > 50%	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOIL		
	CLAYS (Above A-Line on Plasticity Chart, Negligible Organics)	Liquid Limit < 50%	CL	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, CLEAN CLAYS		
		Liquid Limit > 50%	CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS		
Less Than Half by Weight Larger Than No. 200 Sieve	ORGANIC SILTS & CLAYS (Below A-Line on Plasticity Chart)	Liquid Limit < 50%	OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY		
		Liquid Limit > 50%	OH	ORGANIC CLAYS OF HIGH PLASTICITY		
HIGHLY ORGANIC SOILS			PT	PEAT AND OTHER HIGHLY ORGANIC SOILS		



SOIL PARTICLE SIZE

FRACTION	U.S. STANDARD SIEVE			
	Passing		Retained	
	Sieve	Size (mm)	Sieve	Size (mm)
SILT / CLAY	#200	0.075		
SAND				
FINE	#40	0.425	#200	0.075
MEDIUM	#10	2.00	#40	0.425
COARSE	#4	4.75	#10	2.00
GRAVEL				
FINE	0.75"	19	#4	4.75
COARSE	3"	76	0.75"	19
COBBLES	76 mm to 203 mm			
BOULDERS	> 203 mm			
ROCK FRAGMENTS	> 76 mm			
ROCK	>0.76 cubic meter in volume			

GENERAL GUIDANCE FOR ENGINEERING PROPERTIES OF SOILS, BASED ON STANDARD PENET (SPT) DATA

SANDY SOILS				SILTY & CLAYEY S	
Blow Counts N	Relative Density, %	Friction Angle ϕ, degrees	Description	Blow Counts N	Unconfined Strength Qu, ts
0 - 4	0 - 15		Very Loose	< 2	< 0.25
4 - 10	15 - 35	26 - 30	Loose	2 - 4	0.25 - 0.50
10 - 30	35 - 65	28 - 35	Medium Dense	4 - 8	0.50 - 1.00
30 - 50	65 - 85	35 - 42	Dense	8 - 15	1.00 - 2.00
> 50	85 - 100	38 - 46	Very Dense	15 - 30	2.00 - 4.00
				> 30	> 4.00

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists
13240 NE 20th Street, Suite 10, Bellevue, WA 98005
Phone (425) 649-8757 Fax (425) 649-8758

PLATE

BORING: HA1

LOGGED BY: MC **DATE EXCAVATED: 6/15/2018** **GROUND ELEVATION: 246 feet**

DEPTH ft.	USCS	SOIL DESCRIPTION	SAMPLE No.	OTHER TESTS/ COMMENTS
	SP	**SAND,** Dark brown, moist, loose, predominantly medium grain sand with occasional gravel, and organics.	HA1-S1	Probe 7 inches from the surface Roots extend to approximately 8 inches in depth
1	SP	**GRAVELLY SAND,** Brown to brownish-gray, moist, dense, predominantly fine to medium grain sand, with approximately 3-5% gravel, and minimal fines. Gravel content and density increases with depth. Soil becomes very dense at approximately 1.25 feet.	HA1-S2	Probe 3 inches at 8 inches in depth Probe 1 inch at 1.25 feet
2		Borehole terminated at 2 feet due to soil density and gravel content preventing advancement. Ground water was not encountered in this boring.		
3				

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

SOIL BORING LOG

2669 –169th AVE SE
BELLEVUE, WASHINGTON

SCALE: NONE	DATE: 7/5/2018	MADE: MC	CHKD: WC	JOB NO. G-4710	PLATE: A1

BORING: HA2

LOGGED BY: MC **DATE EXCAVATED: 6/15/2018** **GROUND ELEVATION: 246 feet**

DEPTH ft.	USCS	SOIL DESCRIPTION	SAMPLE No.	OTHER TESTS/ COMMENTS
	SP	**SAND,** Dark brown, moist, loose, predominantly medium grain sand with occasional gravel, and organics.	HA1-S1	Probe 6 inches from the surface Roots extend to approximately 8 inches in depth
1	SP	**GRAVELLY SAND,** Brown to brownish-gray, moist, dense, predominantly fine to medium grain sand, with approximately 3-5% gravel, and minimal fines. Gravel content and density increases with depth. Soil becomes very dense at approximately 1 foot.	HA1-S2	Probe 3 inches at 8 inches in depth Probe 1 inch at 1 foot
2		Borehole terminated at 1.75 feet due to soil density and gravel content preventing advancement. Ground water was not encountered in this boring.		
3				

GEO Group Northwest, Inc.
Geotechnical Engineers, Geologists, & Environmental Scientists

SOIL BORING LOG

2669 –169th AVE SE
BELLEVUE, WASHINGTON

SCALE: NONE	DATE: 7/5/2018	MADE: MC	CHKD: WC	JOB NO. G-4710	PLATE: A2

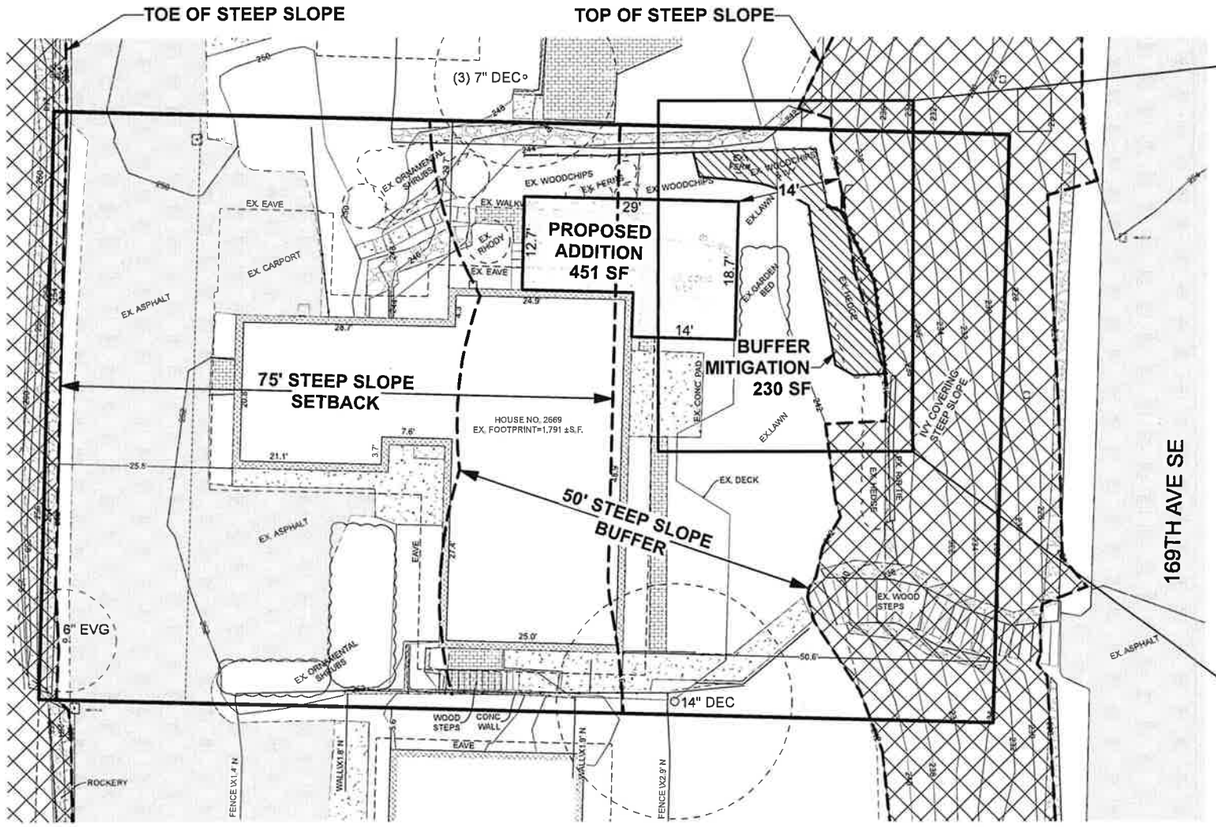
APPENDIX B

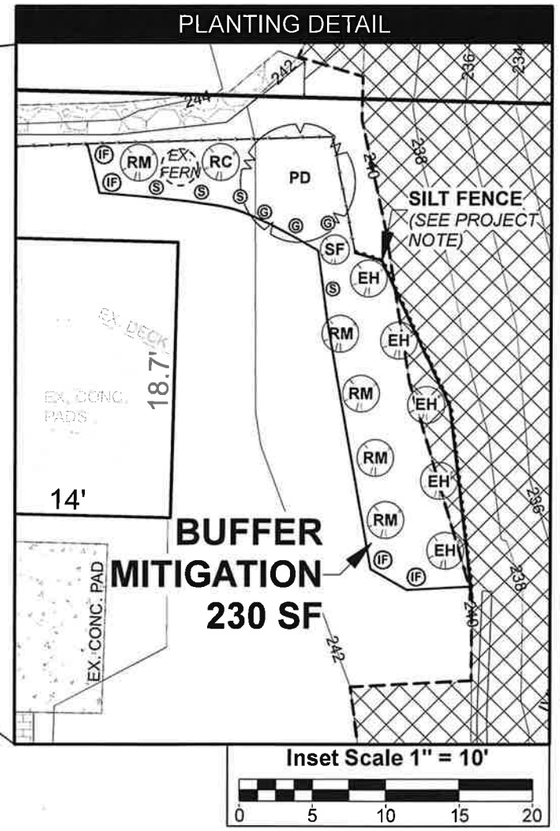
BUFFER MITIGATION MAP

Steep Slope Buffer Impacts and Mitigation Summary

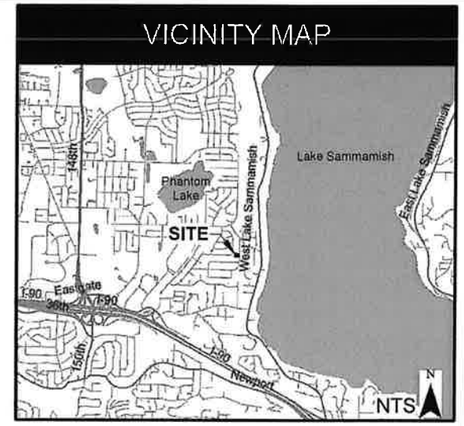
Impact Area (square feet)	Mitigation Type	Mitigation Area (square feet)	Mitigation Ratio
154	Enhancement	230	1.5 :1

BUFFER MITIGATION MAP
FAN SFR ADDITION - 169TH AVE SE
PTN. OF SECTION 12, TOWNSHIP 24N, RANGE 5E W.M.



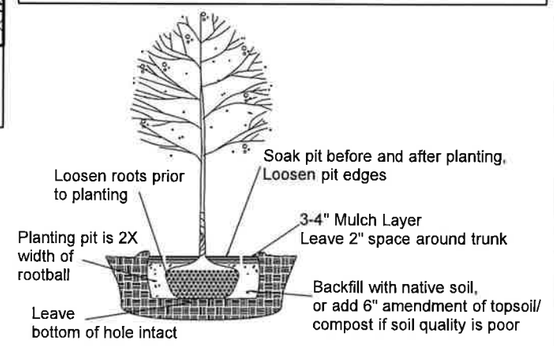


Inset Scale 1" = 10'
0 5 10 15 20



PLANT LEGEND

PD	Pacific Dogwood (*Cornus nuttallii*)	B&B	1
RC	Red-flowering Currant (*Ribes sanguineum*)	1 Gal Pot	1
RM	Rose Meadowsweet (*Spiraea splendens*)	1 Gal Pot	5
EH	Evergreen Huckleberry (*Vaccinium ovatum*)	1 Gal Pot	5
SF	Sword fern (*Polystichum munitum*)	1 Gal Pot	1
IF	Idaho Fescue (*Festuca idahoensis*)	1 Gal Pot	4
S	Coast Strawberry (*Fragaria chiloensis*)	4" Pot	4
G	Wild Ginger (*Asarum canadense*)	4" Pot	3

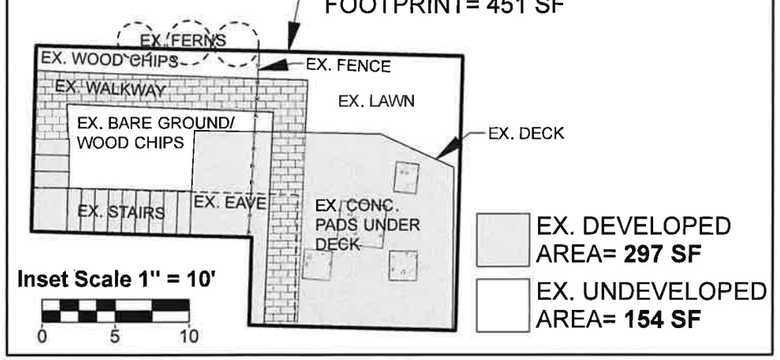


TREE & SHRUB PLANTING DETAIL
No Scale

Scale 1" = 20'
0 10 20 30 40

LEGEND
- STEEP SLOPES >40%
- STEEP SLOPE BUFFER/SETBACK
- BUFFER MITIGATION AREA
- EXISTING VEGETATION

EXISTING CONDITION OF PROJECT FOOTPRINT



Inset Scale 1" = 10'
0 5 10

EX. DEVELOPED AREA= **297 SF**

EX. UNDEVELOPED AREA= **154 SF**

PROJECT NOTE
BEFORE HEDGE REMOVAL COMMENCES, A *SILT FENCE* (OR SIMILAR) SHOULD BE INSTALLED AND LEFT IN PLACE UNTIL NATIVE PLANT INSTALLATION IS COMPLETE AND SOILS ARE STABILIZED.

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett, Washington 98208
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Email: mailbox@wetlandresources.com

BUFFER MITIGATION MAP
FAN SFR ADDITION - 169TH AVE SE
City of Bellevue, WA

John Fan
2669 169th Ave SE
Bellevue, WA 98008

Sheet 1/1
WRI Job # 18328
Drawn by: ED
Date: October 12, 2018